MONANA

JOURNAL of the AUSTRALIAN METEOROLOGICAL ASSOCIATION

Vol. 2 No. 2. September, 1975

THE AUSTRALIAN METEOROLOGICAL ASSOCIATION

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EDITOR'S NOTE: Contributions in the form of letters or articles by readers are most welcome.

TRACY RETRACED

by

A.T. Brunt

On Christmas Day 1974, Australia was stunned to learn of the devastation of Darwin by cyclone Tracy. The old "it can't happen here" type of attitude which was evident for many years had undoubtedly been shaken by cyclone Ada (Hayman Is., January 1970) and cyclone Althea (Townsville, 24 December 1971). However, Tracy really brought it home to most Australians that the tropical coastline of our continent is subject to cyclones which can be every bit as severe as the typhoons of the NW Pacific or the hurricanes of the American region. Although the frequency of tropical cyclone visitation is less in Australia than in the NW Pacific and America, and their intensity also is usually less, every now and then we in Australia are reminded that the tropical cyclone is one of the most destructive and awe-inspiring weather events on the earth's surface.

Of the 60,000 lives lost per annum due to meteorological disasters throughout the world, about 50,000 are attributed directly to tropical cyclones. And of these, approximately 40,000 are lost by drowning in floods and storm surges associated with cyclones, so severe winds are not the main cause of loss of life in tropical cyclones, despite the dramatic effects of wind damage on buildings. It has been estimated that property damage due to hurricanes in USA averages $300m per annum, but the Australian average would undoubtedly be less than this because of the lower frequency of occurrence and the sparsity of population in most of our tropical north.

Tropical cyclones show great variety in size and intensity. Some can be thousands of km in diameter and others, usually in the lower latitudes, as little as 30 or 40 km across. The intensity of a tropical cyclone bears no relationship with its size - some of the small cyclones (in area) can be every bit as intense as the larger ones. Cyclone Tracy was one of the small kind; although very intense it was only 40 km in diameter, almost a "mini-cyclone". As is usual in the lower latitudes, its speed of movement was quite slow, 6 to 8 km/hr, so the period of destructive winds was about 5 hours.

In recent years, early detection of tropical cyclones has been facilitated by satellite surveillance. This was the case with Tracy, as satellite photographs on 21 December 1974 showed a large cloud mass which was the basis of the first tropical cyclone alert being issued on that date. Tracy was subsequently tracked by radar (from 22 December) and further satellite photographs to show a slow SW movement and a typical sinusoidal pattern superimposed on the general track.

It became almost stationary off the SW tip of Bathurst Is. in the early morning of 24 December when reports from the automatic (unmanned) weather station at Cape Fourcroy gave the first indication of its intensity. Details of the track are shown in Figure 1, extracted from the Bureau of Meteorology's Technical Report on cyclone Tracy.

After rounding Cape Fourcroy, the cyclone changed direction towards the ESE, heading directly towards Darwin and a top priority Flash Cyclone Warning was issued at 12.30 pm, 24 December, advising of Tracy's expected landfall early on Christmas morning. Full tropical cyclone warnings were issued generally at 3 hourly intervals and auxiliary warnings based on radar positions were issued half hourly from 9.00 pm, 24 December.

The rest is history. The eye of the cyclone passed directly over Darwin about 4.00 am, 25 December. The aftermath of the cyclone was 50 persons dead, 16 missing and property damage estimated as somewhere between $500m and $1000m. Statistics such as the strongest gust, 217 km/hr, and the lowest barometer reading, 950 mbs, cannot tell the full story. Far more effective is the personal experience. One such story is that included in a letter to his parents from a Bureau observer who was on duty at Darwin Airport during the cyclone. It reads as follows:

> "... Between midnight and 3.00 am we worked as normal but suddenly there was a tremendous crash of glass as two of the office windows blew in and the roof started to rip off. Then came the sound of heavier beams being blown off and landing in front of the office. There were five of us in the office at the time and we started shifting a few of the more vital records to safety but this was short-lived as the place started to break up. By this time we were watching the barograph fall almost vertically and I said to Dave Sinclair "I don't believe that thing" and proceeded to read the mercurial barometer on the wall. When I was taking the reading I could see the level of the mercury dropping as the eye of the cyclone headed straight for us. By this time the wind was gusting to 110 knots and the noise of falling debris, roofs being ripped off, the wind and the rain howling was unbelievable.
>
> At 2.45 am I said to Dave "Better do an obs" but I took one look outside the window and forgot the idea as the air was alive with flying debris of all descriptions. At 3.15 am we had two tremendous gusts of wind and the barograph continued its steep vertical decline. The eye of Tracy passed over the airport about 4.00 am when the wind died down to less than 10 knots all in about 5 minutes. The eye lasted

for about half an hour and during that time we all went out for a bo-peep at the damage. "What a bloody mess" was the expression used by everyone as there was debris everywhere. The sight we saw cannot be put into words.

And the worst was yet to come, with the wind to resume in the opposite direction. As soon as we felt the wind pick up, we hurried back inside to escape Tracy's ravages. Within about five minutes the wind was estimated to be gusting about 90 knots. Then with a terrific blast, 3 of the front windows blew in and paper, books, pencils, in fact everything that wasn't bolted or nailed down in the office, began flying around.

After sheltering in the hallway for about 10 minutes, the power went out so we switched on our torches. The sounds above us were nerve-shattering as the roof was being torn off sheet by sheet and sent flying 2-300 yards away. All of a sudden, there was a sickening crunch above us, about 6 feet from where we were standing, as a large chunk of 4 x 2 timber impaled itself through the ceiling like a dart. It was then that we decided to make a last stand for the only safe room in the office, the comm. room, which was surrounded by offices on 3 sides where the wind was hitting the building. We figured 3 walls between us and Tracy was the best bet for survival and that definitely was the name of the game. By now there was water pouring from the ceiling as all of the roof had gone and we were standing in water about 4 inches deep.

By about 6.45 am it was light enough to see; and what a sight. The light aircraft, usually parked meticulously on the parking apron, were stacked up one end as if a giant bulldozer had put them there. Everywhere there were bits of roofing iron, drain pipes, windows, cars; in fact everything from a desk diary to a Fokker Friendship. It's just too hard to describe the scene of utter destruction that greeted us on Christmas morning."

After passing through Darwin, Tracy quickly lost its wind intensity and degenerated into a rain depression, moving slowly across southern parts of Arnhem Land in an ESE direction.

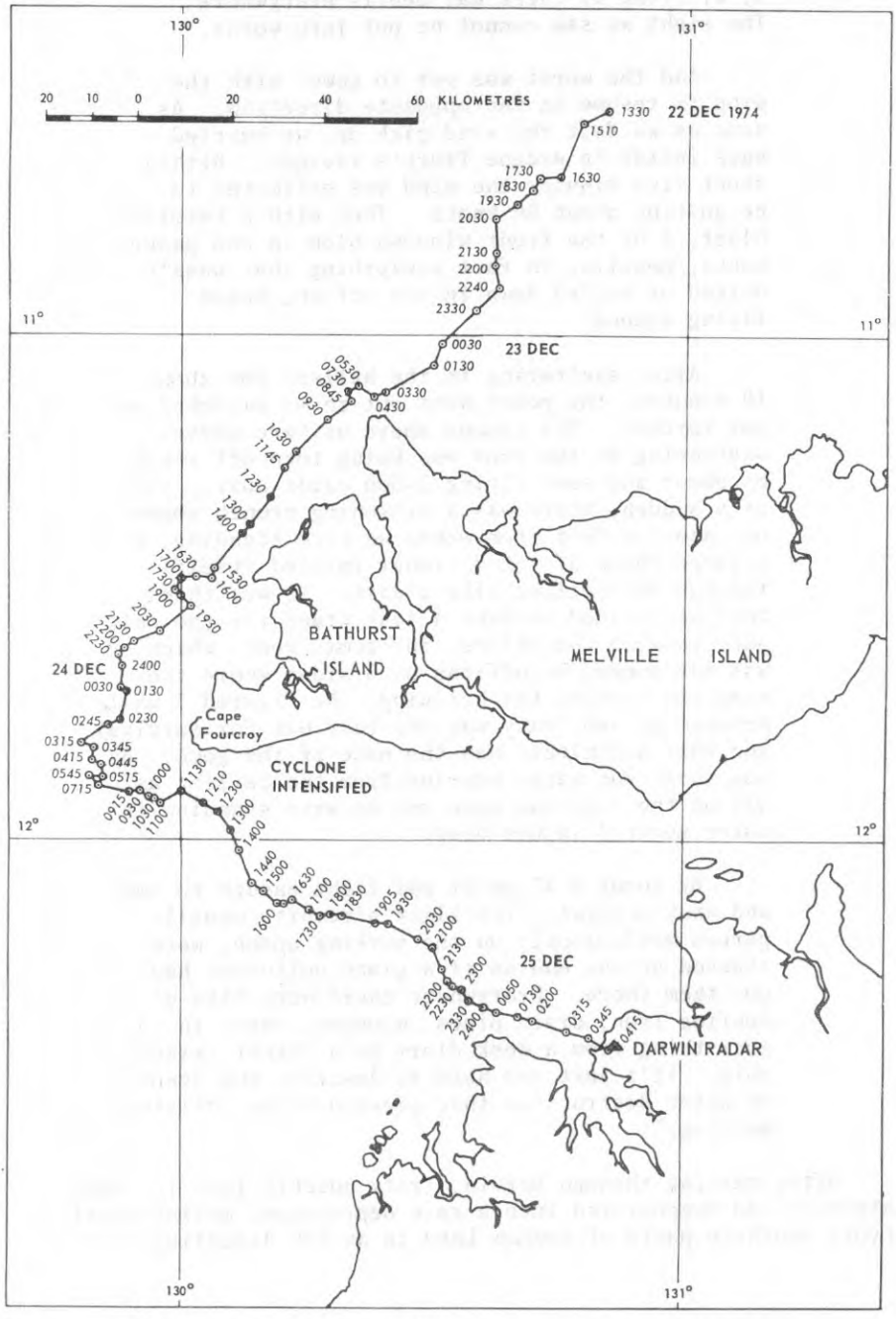

Fig 1. Track of tropical cyclone TRACY from radar positions (times CST)

A.P.P. ALERTS IN ADELAIDE

by

L. Broadbridge

Air Pollution Potential Alerts are essentially a forecast of weather conditions which would lead to heavy smog in the Adelaide Area, assuming, of course, that sufficient pollutants are available. They are not really warnings, and are referred to as "APP alerts".

At this stage it is worthwhile defining the word smog. The original definition is "a mixture of smoke and fog". Now it is more common to use the word "smog" to describe any form of atmospheric pollution.

When an APP alert is issued, people are *requested* to refrain from burning rubbish in the open. There are no legal penalties involved if an APP alert is disregarded, which is not the case when fire bans are imposed.

The APP alert system only operates during the period when fire-weather services are not in operation. This is usually from about mid-April to mid-October. The reason for this is to avoid possible confusion when fire-bans are imposed, because a person could hear on the radio that "no APP alert has been issued" and light an incinerator when, in fact, a fire-ban has been imposed.

Public and corporate acceptance of the APP alert system has been excellent. The alerts are first broadcast at 7.00 am daily, and included in the automatic telephone forecast. Many people also phone the Bureau during the day to check about a possible alert, and local councils and companies are very conscious of a loss of public goodwill by burning rubbish on "APP alert" days.

Several types of alerts are issued. The public can be requested to refrain from burning during "today and tonight" or "before noon" for example. This latter case occurs when an alert has been issued for the previous day and night, and smog is persisting in the morning until an increase in ventilation due to heating or freshening winds occur during the day, thus alleviating the smog problem.

When the weather situation is very static, and alerts are issued for many consecutive days, it has been found that some people are seriously inconvenienced by not burning rubbish, particularly if this in itself causes a health hazard. For example, a woman who ran a cattery used sawdust to help make her cats perform toiletry functions in more hygienic circumstances. Not being able to burn the soiled sawdust for two weeks caused her much discomfort and concern. Being able to burn it probably caused her neighbours discomfort and concern also. To overcome

this type of problem, which occurs when consecutive APP alert days are declared, the request is worded so that people can burn rubbish during the middle of the day when ventilation is normally greatest.

Some asthma and bronchial sufferers are very allergic to concentrated smoke, and such people stand to gain considerably if nearby smoke sources are eliminated because of the issue of an APP alert. As well as a health benefit, there is also the more aesthetic benefit of reducing the smog pall which can persist over the attractive Adelaide area.

The heaviest concentration of pollutants will occur when highs persist near Adelaide, or when a ridge of high pressure persists for several days or more, leading to an accumulation of smoke over the period. These situations are conducive to light surface and gradient winds (*ie*, low ventilation) and marked nocturnal inversion layers near the surface.

AN UNUSUALLY COOL WEEK IN NOVEMBER 1974

by

G. Vecchio

(A short lecture topic given at the Australian Meteorological Association Meeting on 5 December 1974)

The frequent occurrence of southerly winds over the settled areas of South Australia during November 1974 resulted in conditions which were generally drier and cooler than normal. This was particularly true of the last week in November.

Inspection of the weather charts for the period Sunday 25 to Saturday 30 (see Fig 1) shows that on Sunday a small low located over waters to the west of the Bight extended a front northwards into southern Western Australia. Conditions over South Australia were warm to hot fairly generally with Adelaide reaching a maximum temperature of 33.1°C at 6.00 pm. However, the disturbance over the western Bight moved rapidly eastward during that day and a frontal passage was experienced in Adelaide about 2.00 am on Monday. After the frontal passage the temperature in Adelaide dropped significantly and on Monday it did not exceed 20.1°C. It was even colder for the next four days. On Saturday 30 a maximum temperature of 24.2°C was recorded at Adelaide and this was still 1°C below average for November. Table 1 lists the maxima, minima and their time of occurrence for this week as recorded at Adelaide.

Following the passage of the front the freezing level at Adelaide dropped from a maximum of 13 000 feet on Sunday to a minimum of 5 500 feet on Tuesday.

Despite the cold and blustery conditions very little rain was actually recorded over the State although some showers were experienced and these tended to be most frequent on Tuesday and Wednesday.

TABLE 1

	24.11.74	25.11.74	26.11.74	27.11.74	28.11.74	29.11.74	30.11.74
TMX	33.1	29.4	18.7	18.6	18.9	18.5	24.2
time	1800	0145	1430	1420	1430	1355	1700
TMN	15.8	14.2	12.7	10.8	11.7	12.5	10.0
time	0615	2359	0415	1550	1600	0215	0230

NOTE: (1) Average maximum temperature for Adelaide : November is 25.2°C.

(2) Maximum temperature on Monday was recorded before frontal passage. After frontal passage the temperature did not exceed 20.1°C at 1700.

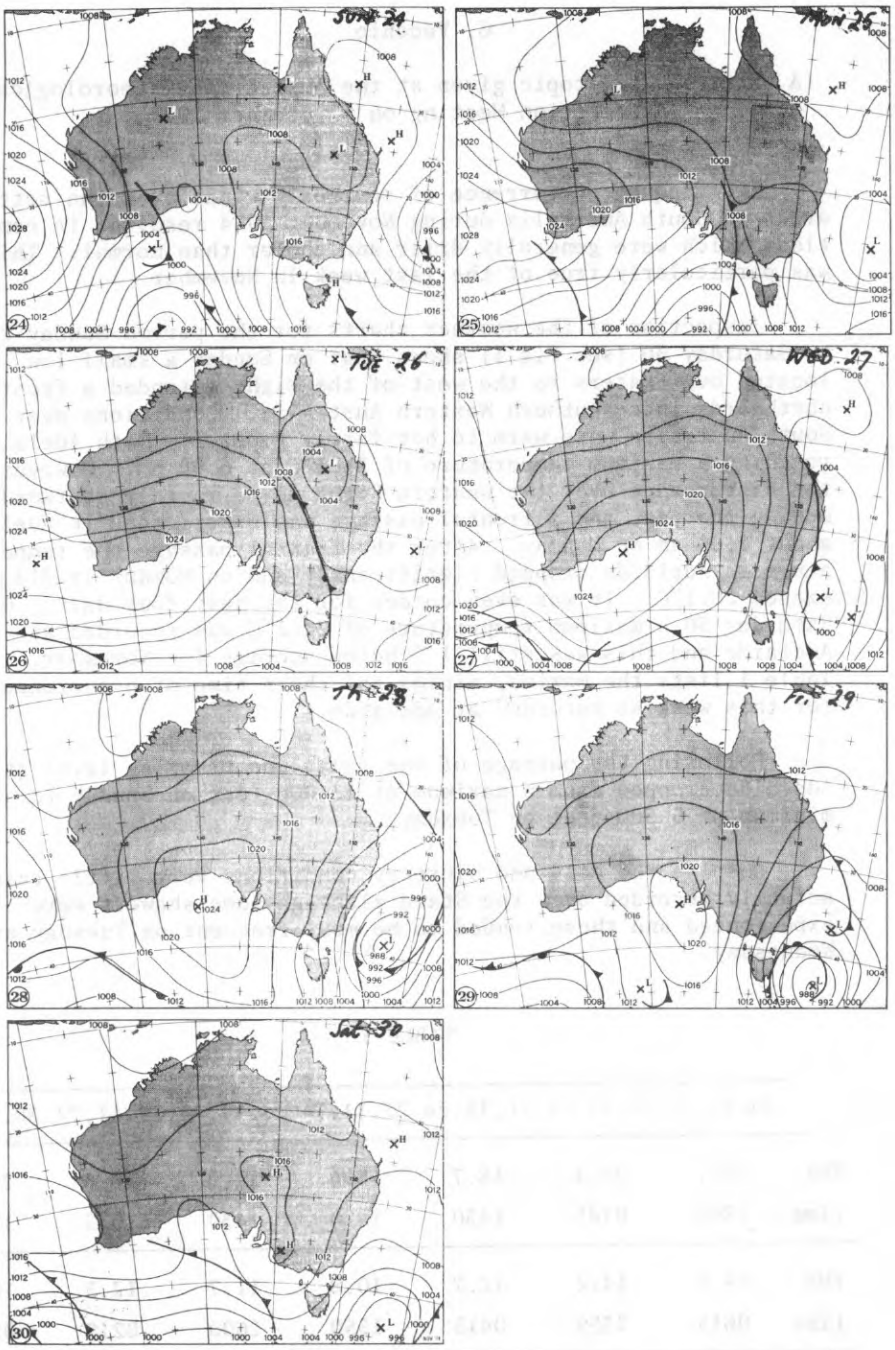

Fig. 1. 9 a.m. Sypnotic Chart for period Sunday 24/11/74 to Saturday 30/11/74 (by courtesy Aust.Bur.of Met.)

CORIOLIS' DELIGHT

(A talk given by Mr A. Robin as taken down by Mr R. Whatmough)

"Why doesn't the air blow straight from high pressure to low?" This question was in many members' minds after the June chart-drawing evening. Mr Angus Robin from the Bureau explained the mystery at the August meeting.

Coriolis discovered last Century that the rotation of the earth tends to deflect all moving objects, in a direction that depends on which hemisphere they are in. (Many people still believed that the "Coriolis force" he described causes the water in the bath to swirl as it runs out the plughole, and that it always swirls in the same direction in the same hemisphere. Unfortunately that doesn't work in practice - there are too many other influences on which way the water turns.) Anyway, how does it work?

Consider two men on a merry-go-round - we call them P and Q. If P throws a ball to Q as they go, what happens? To someone watching from the ground, the ball starts in the direction of Q and continues in the same direction, but by the time it has covered the distance to Q, the merry-go-round has spun Q out of the way and it misses him.

To P and Q the results look rather different. The merry-go-round is stationary and the ground is spinning around. The ball leaves P's hand towards Q, but the straight path which it is supposed to follow seems to spin with the ground and the ball curves to one side. If, for example, the merry-go-round turns once every 10 seconds, P and Q are 15 feet apart and the ball is thrown at 20 feet a second, it will miss by 6 feet and Q will probably fall off his horse.....

The earth is moving in a more complicated way than the merry-go-round, moving round the sun once a year and spinning on its own axis once a day. Furthermore, a piece of the earth's surface does not spin about a vertical line as the merry-go-round did. It may be at any angle to the earth's axis. Fortunately, a few calculations show that only the daily spin is important, and the effect of where we are can readily be taken into account.

It turns out that moving objects are deflected to the right in the northern hemisphere and to the left in the southern hemisphere. The effect is strongest at the poles, and falls off towards the equator. Right on the equator there is no deflection at all (that is just as well, it saves deciding exactly which side we are on).

If an object moves in a straight line on the earth's surface, a force must be present to stop it curving off to one side. Thus a car driven on a straight road will cause a measurable sideways pressure on the tyres, and a jet pilot must adjust his rudder to balance the tendency of his plane to curve off course.

In the case of moving air, the main forces present are pressure and the friction caused by movement across the ground. In a steady wind these must combine to keep the air from curving to one side. Suppose we are in the southern hemisphere and that there is a pressure gradient. A blob of stationary air will have only the pressure force acting on it and it will start to move straight towards the lower pressure. Once it is moving the earth's rotation turns it to the left and friction tends to slow it down again. It finally reaches a steady speed and direction when all three forces balance.

Over the sea, the friction is small but rotation turns the blob to the left, so it must end up travelling so that the pressure gradient pulls it to the right without speeding it up or slowing it down. It can only do this by travelling along the isobars with the low pressure on its right.

Over the land, friction is more important and will try to slow the blob down. It must travel so that the pressure gradient pulls it to the right to keep it on a straight course and forward to keep up its speed. This it does by travelling at an angle to the isobars, with the low pressure to the right but somewhat ahead of it.

That is how we find it when we examine wind directions on the weather chart.

WALKING IN THE FLINDERS RANGES
(WITH AN EYE TO THE WEATHER)

(A talk given to Australian Meteorological Association by Mr C.W. Bonython as taken down by Mr R. Whatmough)

The Flinders Ranges stretch for some 300 miles, reaching a maximum height of about 4000 feet. First seen by Matthew Flinders, they are formed of rocks up to 1500 million years old. Mr Charles Bonython, the guest speaker at the August meeting, was the first man to walk these ranges from end to end. He described his walk to us and illustrated his talk with slides.

Mr Bonython had often considered a non-stop six-week walk along the range from end to end, but not until he turned fifty did he start serious planning. He decided to make the trip in stages, each about a week's walking, with a companion. As it turned out, there were some nine stages and several changes of companion. About 1½ lb of dehydrated food a day was required.

Stage 1 began at Crystal Brook. Other places visited on this stage were Beetaloo, Mt Zion and The Bluff. The walk was intended to follow the easy ridgetops, but a missed turn landed the two in rugged Telowie Gorge. Only a little dirty water was available here, but overnight rain brought rockfalls and muddy walking for the following day. To allow an appointment at Mambray Creek to be kept, the walk was re-routed along the foot of the range to that place. Mr Bonython hoped that this stretch would give him good training, but he sprained tendons in both his ankles instead. Apart from a three-mile section at Mambray Creek and a climb of Mt Remarkable (which were carefully filled in later) the planned walk to Wilmington was completed. The troubled ankles grew increasingly painful towards the end, and a thirteen-week rest was needed to heal them!

Stage 2 began at Wilmington and passed Mt Maria and Horrocks Pass. The weather was dry at first - water was scarce at the first camp - but a dust storm struck the following day. A sheltered second campsite was chosen in case a squally change was coming, but the change brought only fog. Water remained scarce for another two days as Mt Brown and the Devil's Peak were climbed. Then heavy rain fell on the approach to the Dutchman's Stern. The "Stern" was not quite reached, and heavy rain fell overnight, but a large fire, built to "intimidate the weather" was some consolation. The walkers returned to Quorn.

Stage 3, walked several months later, began at Quorn and completed the visit to the Dutchman's Stern, continuing to Mt Arden, Buckaringa Gorge, Proby's Grave and Yappala Hill. The last days were hot and dry, and Mr Bonython promised himself "No walking in summer!"

Incredibly, Stage 4 set out from Hawker in mid-January 1968. Walking was to be done at night, to avoid the worst heat. As it happened, this was the very time an upper low pressure system chose to wander back and forth across the continent, so there was rain on and off for 15 days. The walkers visited Arkaba Creek (with swimming) and Mt Ide and approached Wilpena Pound, where large thunderstorms were forming. A side trip to climb Mt Aleck took nine hours. The 3700 feet summit was reached in 31°C heat - the visitors' book there showed no other January walkers so far! The walk then continued over Bridle Gap to Cooinda Camp in the Pound, where mists were the order of the day. After hot return trips to Pompey's Pillar, St Mary's Peak (30°C) and Bunyeroo Gorge (36°C followed by a thunderstorm) the walkers returned to Wilpena, where the creek welcomed them by flooding next morning.

Stage 5 began at Bunyeroo Gorge and went to Mt Rupert, Brachina Gorge, Mt Hayward and Aroona Hut. As the hut was approached the weather became cloudy. Big cumulonimbus mammatus clouds loomed. Tourists and Highways Department vehicles scattered. 1½ to 2 inches of rain fell that night and, until it was propped up, the saggy hut roof was more a hindrance than a help. Next morning began with low cloud, but the skies soon cleared and the walk to Mt Falkland, Mt Elkington and Oratunga Station near Blinman was completed in fine weather. Walking continued from Oratunga with overcast skies. Could it rain again so soon? It did, for 24 hours steadily. The walkers visited Narina Pound and Mt Patawarta on its rim. Showers continued as they climbed Mt MacFarlane and Mt Tilley but better weather followed as the stage ended at Mt Hack. Here the ranges branch - the Willouran Ranges lie to the northwest and the main range turns to the northeast.

Stage 6, from Mt Hack to Mt Serle, included the coldest night of the trip. At the first camp it was a chilly -1°C outside, but the tent kept it up to a cosy +1½°C inside. The water, left outside to fend for itself, did it the "hard" way.

Stage 7, in September 1968, crossed the Gammon Ranges, a rugged and remote area with a 3000 feet plateau covered with scrub and cut by hidden gorges. It was walked with three companions. Cleft Peak and Benbonyathe Hill were climbed. The army helped in this section by flying in some water containers by helicopter. Only one problem they left so much the empty containers were hard to carry out! This stage was completed by climbing Mt Warren-Hastings and walking into Arkaroola.

On Stage 8, from Arkaroola to Yudnamutana, visits were made to Mt Painter, The Armchair and Mt MacDonald.

The last stage began, in late October 1968, with a climb to Freeling Heights and Mt Saturday, then continued to Tindelpina Hut and to an un-named mountain dubbed "Thursday", climbed in 38°C heat. Mr Bonython had started this stage with a heavy load of water, but he was soon resorting to waterholes. On one day, the only water was spiced with dead sheep - too bad! Increasing heat made progress very slow. A cool change, preceded by a sandstorm, brought the boil back to a simmer and walking was found easier at night. The final

days brought the walkers by the Hamilton River, Terapinna water-hole and Twelve Springs, then across the desert plains to Mt Hopeless, an isolated hill that marks the northern end of the ranges.

The end of the journey was celebrated with two bottles of claret, followed by a downpour of rain. The trip had started 18 months earlier and had taken 72 walking days and 86,000 feet of climbing. Now it finished with a 4 hour light plane flight back along the range.

The unstoppable Mr Bonython did not consider his walk completed however. There was still the other branch of the Flinders Ranges, the Willouran Range from Mt Hack to Hermit Hill, west of Marree. With a support party to set up camps, and a little galvanised wire to fix battered boots, this section was walked in 14 days, in April this year.

Mr Bonython's last word on weather and walking? "RAIN is a four-letter word....."

THE BRITISH SCIENCE MUSEUM EXHIBITION OF METEOROLOGICAL INSTRUMENTS

by

J. Hogan

On a recent overseas trip I visited the British Science Museum and saw the exhibition of meteorological instruments.

I will attempt to describe these in some semblance of chronological order, but maybe not strictly so, as some dates were not available. Some of the instruments on display, although not essentially meteorological instruments, were of sufficient interest, so I will describe some of these also.

The Water Clock

This was an alabaster bowl, which was wide at the top and narrow at the bottom. It was so designed as to allow a constant outflow of water through a small orifice, or tap. Each level inside the vessel indicated the time of the day.

The reason was not given, but it appears to have been used mainly at night time. Perhaps they had alternative means, such as sun dials for day time use.

Sun Dials

The second interesting piece of equipment dated back to 670 AD.

It was a large stone which had been erected on the south face of, probably, the church at Bewcastle Cross, Cumberland.

There are only four main hour lines carved into the stone as at that time, the day was divided into four main tides or quarters of the day. There were several other interesting examples of this ancient time measuring equipment.

Hygrograph

This hygrograph was invented by Leonardo DaVinci - an incredible man - sculptor, painter, mathematician and inventor, with inventions ranging from a wood turning machine to an aeroplane.

The hygrograph he invented in 1500 consisted of an ordinary chain balance with a graduated scale and indicator. On one plate he used a piece of wax which is non absorbent and on the other he had a piece of cotton wool which is absorbent. The variation in humidity was indicated by the pointer. Whether he impregnated the wool with anything is not stated, but in his own hand writing attached to the instrument is written:

"Means of seeing when the weather will fail."

Dew Point Hygrometer

This exhibit was a replica of the first Dew Point Hygrometer as it was called, which was invented by Grand Duke Ferdinand II, who was also a renowned inventor, in 1660. The original is in the Milan Museum. It consists of a glass cone lagged inside with pitch and filled with ice and snow. The outer casing was so designed as to allow the condensed vapour to run into a glass tube which permitted the water to drop into a collecting vessel. The number of drops per minute were counted and therefore gave a measurement of humidity.

Hygrograph

This particular display was invented in 1700 but its inventor is not known.

It consisted of two pieces of plywood joined at the bottom but separated at the top. Each piece of ply consisted of a piece with horizontal grain attached to a piece with vertical grain, resulting in a bending of the pieces with variations in humidity. The base is fixed and a horizontal scale across the top indicates the separation of the tops, which then becomes a measure of the humidity.

Pressure

A diagram shows Torricelli and his assistant in 1644 demonstrating with several glass tubes of different lengths, with the open ends immersed in mercury, that the heights of the mercury is the same in all tubes despite the variation in lengths.

Illustrating the effect of atmospheric pressure, there was another diagram of the two "Magdeburg Hemispheres" experiment, with which most students of physics are familiar. Two large copper spheres were placed together and the air exhausted. The diagram illustrates the efforts of two teams of horses trying to pull them apart.

This illustration and experiment was arranged by another famous physicist and inventor Otto Von Guericke, who was also the Mayor of Magdeburg, and took place on 4 August 1657. Von Guericke was also responsible for inventing one of the first vacuum pumps, a copy of which is in the Museum, but the original is in the famous Science Museum in Munich.

Thermometer

A large number of early type thermometers are on display. The earliest celsius thermometer in its present form is attributed to Christin of Lyons (France) in 1743. There was an earlier model displayed which was made in 1742 but the scale was 100^{o} to 0^{o} and Christin reversed the scale to 0^{o} to 100^{o} in 1743.

The Adams Microscope

Although not a meteorological instrument this is one of the most remarkable instruments in the exhibition.

It was designed by the famous instrument maker Adams in 1770 and consists of about five different viewers, but it is remarkable for its ornate design in silver filigree with various motifs and figures in the solid silver used as supports. It was donated to the Museum by George VI who, by the number of donations he made to the museum appears to have had a great interest in science.

Greenwich Screens

The original Greenwich screen appears to have been designed by James Glustier in 1841. It is mounted on a swivel to enable it to be turned by hand away from the direct rays of the sun.

One year later Henry Lawson F.R.S. designed a similar one which always faced to the north, but it was not until 1863, some twenty years later, that Thomas Stevenson invented the double louvred screen which is in almost universal use today.

Barometers

Mention has been made of Torricelli, but Sir Samuel Morland in 1650 seems to have been credited with the first accurate mercury barometer which was designed with the stem bent at the 27 inch mark to an angle of about 70 degrees. This was known as the Diagonal Barometer and gave greater magnification of the change in pressure. The vernier for more accurate reading was not introduced until 1760.

There is an interesting illustration on display of Sir Francis Ronold's photographic recording barometer built in 1867.

By means of a gas lamp an image of the mercury surface was projected onto light sensitive paper. This gave a continuous recording of the variations in pressure against a fixed base line. The shutter automatically closed each hour to give a time mark.

The first aneroid barometer, very similar to the types in use at the present time, was built by Lucien Virie in 1843.

Many other very interesting pieces of meteorological equipment, far too many to discuss in this article, were on display. However, the first meteorgraph designed and used by Dines in 1906 should be mentioned. It was encased in a bamboo frame for safe landing-recording pens scribed the measurements on a silvered surface recording plate and the old double metallic plate recorder was used as a thermograph.

There is also an original Decca Wind Finding Radar WF1, built in 1956. Only 49 were produced and this particular one was in service at Halley Bay in Antarctica from 1957 to 1962.

Weather Journal

A copy of the earliest Weather Journal kept by the Rev William Merle from 1337 to 1344 is exhibited, but I was fortunate to be able to see the original manuscript in the Bodleian Library in Oxford.

There is also a copy of the first forecast issued by the British Meteorological Office on 1 January 1881.

McALISTER PRINT 3543/75